

PMI7J003

PROCESS CONTROL & INSTRUMENTATION(3-0-0)

MODULE-I

(10hours)

Introduction: Need for process control; justification in terms of overall technical and economic benefits. Fundamental Aspects: Recognition of dynamic nature of control operation; identification of controllable and non-controllable operating variables; need for obtaining quantitative relationships for describing the effect of controllable operating variables on process performance; defining control objectives; identification of process and plant constraints

MODULE-II

(10hours)

Basic Data Required for Control System Design: Ways of obtaining data for control system design; Nature and frequency of process disturbances; investigating basic properties of process response (impulse and step response).

MODULE-III

(10hours)

Types of Control Actions: Feed Forward and feedback control; construction of a feedback controller; proportional action, integral action and derivative action; tuning of feedback controllers; multiple input control; ratio control and cascade control. Control of Individual Unit Operations: Crushing, grinding and flotation circuits; control of thickener and other allied operations.

MODULE-IV

(10hours)

Instrumentation for measurement: On-line particle size distribution, Metallurgical grade analysis and coal analysis ; pulp density, pulp level, froth level, slurry flow rate, ball mill load and other required measurements. Some Published Case Studies: Some examples taken from published paper on actual implementation of control systems in an operating plant and the control strategies used

REFERENCES:

1. Advanced Control and Supervision of Mineral Processing Plants, Edited by Daniel Sbárbaro and René del Villar, Springer
2. [George Stephanopoulos](#): Chemical Process Control: An Introduction to Theory and Practice, PHI Learning